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On Dialectics

("The Old Preface to Anti-Dühring")

The following work does not by any means owe its origin to an "inner urge". On the contrary, my friend Liebknecht can testify to the great effort it cost him to persuade me to turn the light of criticism on Herr Dühring's newest socialist theory. Once I made up my mind to do so I had no choice but to investigate this theory, which claims to be the latest practical fruit of a new philosophical system, in its connection with this system, and thus to examine the system itself. I was therefore compelled to follow Herr Dühring into that vast domain in which he speaks of all possible things and of some others as well. That was the origin of a series of articles which appeared in the Leipzig *Vorwärts* from the beginning of 1877 onwards and are here presented as a connected whole.

When, because of the nature of the subject, the critique of a system, so extremely insignificant despite all self-praise, is presented in such great detail, two circumstances may be cited in excuse. On the one hand this criticism afforded me the opportunity of setting forth in positive form in various fields my outlook on controversial issues that today are of quite general scientific or practical interest. And while it does not occur to me in the least to present another system as an alternative to Herr Dühring's, it is to be hoped that, notwithstanding the variety of material examined by me, the reader will not fail to observe the interconnection inherent also in the views which I have advanced.

On the other hand the "system-creating" Herr Dühring is not an isolated phenomenon in contemporary Germany. For some time now in that country philosophical, especially natural-philosophical, systems have been springing up by the dozen overnight, like mushrooms, not to mention the countless new systems of

politics, economics, etc. Just as in the modern state it is presumed that every citizen is competent to pass judgment on all the issues on which he is called to vote; and just as in political economy it is assumed that every buyer is a connoisseur of all the commodities which he has occasion to purchase for his maintenance — so similar assumptions are now to be made in science. Everybody can write about everything and "freedom of science" consists precisely in people deliberately writing about things they have not studied and putting this forward as the only strictly scientific method. Herr Dühring, however, is one of the most characteristic types of this bumptious pseudo-science which in Germany nowadays is forcing its way to the front everywhere and is drowning everything with its resounding sublime nonsense. Sublime nonsense in poetry, in philosophy, in political economy, in historiography; sublime nonsense in the lecture room and on the platform, sublime nonsense everywhere; sublime nonsense which lays claim to a superiority and depth of thought distinguishing it from the simple, commonplace nonsense of other nations; sublime nonsense, the most characteristic mass product of Germany's intellectual industry — cheap but bad — just like other German-made goods, only that unfortunately it was not exhibited along with them at Philadelphia. Even German socialism has lately, particularly since Herr Dühring's good example, gone in for a considerable amount of sublime nonsense; the fact that the practical Social-Democratic movement so little allows itself to be led astray by this sublime nonsense is one more proof of the remarkably healthy condition of our working class in a country where otherwise, with the exception of natural science, at the present moment almost everything goes ill.

When Nägeli, in his speech at the Munich meeting of natural scientists, voiced the idea that human knowledge would never acquire the character of omniscience, he must obviously have been ignorant of Herr Dühring's achievements. These achievements have compelled me to follow him into a number of spheres in which I can move at best only in the capacity of a dilettante. This applies particularly to the various branches of natural science, where hitherto it was frequently considered more than presumptuous for a "layman" to want to have any say. I am encouraged somewhat, however, by a dictum uttered, likewise in Munich, by Herr Virchow and elsewhere discussed more in detail, that outside of his own speciality every natural scientist is only a semi-initiate, *vulgo*: layman. Just as such a specialist may and must take the liberty of encroaching from time to time on neighbouring fields, and is granted indulgence there by the specialists concerned in respect of minor inexactitudes and clumsiness of expression, so I have taken the liberty of citing natural processes and laws of nature as examples in proof of my general theoretical views, and I hope that I can count on the same indulgence. The results obtained by modern natural science force themselves upon everyone who is occupied with theoretical matters with the same irresistibility with which the natural scientist today is willy-nilly driven to general theoretical conclusions. And here a certain

compensation occurs. If theoreticians are semi-initiates in the sphere of natural science, then natural scientists today are actually just as much so in the sphere of theory, in the sphere of what hitherto was called philosophy.

Empirical natural science has accumulated such a tremendous mass of positive material for knowledge that the necessity of classifying it in each separate field of investigation systematically and in accordance with its inner inter-connection has become absolutely imperative. It is becoming equally imperative to bring the individual spheres of knowledge into the correct connection with one another. In doing so, however, natural science enters the field of theory and here the methods of empiricism will not work, here only theoretical thinking can be of assistance. But theoretical thinking is an innate quality only as regards natural capacity. This natural capacity must be developed, improved, and for its improvement there is as yet no other means than the study of previous philosophy.

In every epoch, and therefore also in ours, theoretical thought is a historical product, which at different times assumes very different forms and, therewith, very different contents. The science of thought is therefore, like every other, a historical science, the science of the historical development of human thought. And this is of importance also for the practical application of thought in empirical fields. Because in the first place the theory of the laws of thought is by no means an “eternal truth” established once and for all, as philistine reasoning imagines to be the case with the word “logic”. Formal logic itself has been the arena of violent controversy from the time of Aristotle to the present day. And dialectics has so far been fairly closely investigated by only two thinkers, Aristotle and Hegel. But it is precisely dialectics that constitutes the most important form of thinking for present-day natural science, for it alone offers the analogue for, and thereby the method of explaining, the evolutionary processes occurring in nature, inter-connections in general, and transitions from one field of investigation to another.

Secondly, an acquaintance with the historical course of development of human thought, with the views on the general inter-connections in the external world expressed at various times, is required by theoretical natural science for the additional reason that it furnishes a criterion of the theories propounded by this science itself. Here, however, lack of acquaintance with the history of philosophy is fairly frequently and glaringly displayed. Propositions which were advanced in philosophy centuries ago, which are often enough completely dead philosophically, are frequently put forward by theorising natural scientists as brand-new wisdom and even become fashionable for a while. It is certainly a great achievement of the mechanical theory of heat that it strengthened the principle of the conservation of energy by means of fresh proofs and put it once more in the forefront; but could this principle have appeared on the scene as something so absolutely new if the

worthy physicists had remembered that it had already been formulated by Descartes? Since physics and chemistry once more operate almost exclusively with molecules and atoms, the atomic philosophy of ancient Greece has of necessity come to the fore again. But how superficially it is treated even by the best of natural scientists! Thus Kekulé tells us (*Ziele und Leistungen der Chemie*) that Democritus, instead of Leucippus, originated it, and he maintains that Dalton was the first to assume the existence of qualitatively different elementary atoms and was the first to ascribe to them different weights characteristic of the different elements. Yet anyone can read in Diogenes Laertius (X, §§43-44 and 61) that already Epicurus had ascribed to atoms differences not only of magnitude and form but also of *weight* that is, he was already acquainted in his own way with atomic weight and atomic volume.

The year 1848, which otherwise brought nothing to a conclusion in Germany, accomplished a complete revolution there only in the sphere of philosophy. By throwing itself into the field of the practical, here setting up the beginnings of large-scale industry and swindling, there initiating the mighty advance which natural science has since experienced in Germany and which was inaugurated by the caricature-like itinerant preachers Vogt, Büchner, etc., the nation resolutely turned its back on classical German philosophy that had lost itself in the sands of Berlin Old-Hegelianism. Berlin Old-Hegelianism had richly deserved that. But a nation that wants to climb the pinnacles of science cannot possibly manage without theoretical thought. Not only Hegelianism but dialectics too was thrown overboard — and that just at the moment when the dialectical character of natural processes irresistibly forced itself upon the mind, when therefore only dialectics could be of assistance to natural science in negotiating the mountain of theory — and so there was a helpless relapse into the old metaphysics. What prevailed among the public since then were, on the one hand, the vapid reflections of Schopenhauer, which were fashioned to fit the philistines, and later even those of Hartmann; and, on the other hand, the vulgar itinerant-preacher materialism of a Vogt and a Büchner. At the universities the most diverse varieties of eclecticism competed with one another and had only one thing in common, namely, that they were concocted from nothing but remnants of old philosophies and were all equally metaphysical. All that was saved from the remnants of classical philosophy was a certain neo-Kantianism, whose last word was the eternally unknowable thing-in-itself, that is, the bit of Kant that least merited preservation. The final result was the incoherence and confusion of theoretical thought now prevalent.

One can scarcely pick up a theoretical book on natural science without getting the impression that natural scientists themselves feel how much they are dominated by this incoherence and confusion, and that the so-called philosophy now current offers them absolutely no way out. And here there really is no other way out, no

possibility of achieving clarity, than by a return, in one form or another, from metaphysical to dialectical thinking.

This return can take place in various ways. It can come about spontaneously, by the sheer force of the natural-scientific discoveries themselves, which refuse any longer to allow themselves to be forced into the old Procrustean bed of metaphysics. But that is a protracted, laborious process during which a tremendous amount of unnecessary friction has to be overcome. To a large extent that process is already going on, particularly in biology. It could be greatly shortened if the theoreticians in the field of natural science were to acquaint themselves more closely with dialectical philosophy in its historically existing forms. Among these forms there are two which may prove especially fruitful for modern natural science.

The first of these is Greek philosophy. Here dialectical thought still appears in its pristine simplicity, still undisturbed by the charming obstacles which the metaphysics of the seventeenth and eighteenth centuries — Bacon and Locke in England, Wolff in Germany — put in its own way, and with which it blocked its own progress, from an understanding of the part to an understanding of the whole, to an insight into the general inter-connection of things. Among the Greeks — just because they were not yet advanced enough to dissect, analyse nature — nature is still viewed as a whole, in general. The universal connection of natural phenomena is not proved in regard to particular; to the Greeks it is the result of direct contemplation. Herein lies the inadequacy of Greek philosophy, on account of which it had to yield later to other modes of outlook on the world. But herein also lies its superiority over all its subsequent metaphysical opponents. If in regard to the Greeks metaphysics was right in particulars, in regard to metaphysics the Greeks were right in general. That is the first reason why we are compelled in philosophy as in so many other spheres to return again and again to the achievements of that small people whose universal talents and activity assured it a place in the history of human development that no other people can ever claim. The other reason, however, is that the manifold forms of Greek philosophy contain in embryo, in the nascent state, almost all later modes of outlook on the world. Theoretical natural science is therefore likewise forced to go back to the Greeks if it desires to trace the history of the origin and development of the general principles it holds today. And this insight is forcing its way more and more to the fore. Instances are becoming increasingly rare of natural scientists who, while themselves operating with fragments of Greek philosophy, for example atomistics, as with eternal truths, look down upon the Greeks with Baconian superciliousness because the Greeks had no empirical natural science. It would be desirable only for this insight to advance to a real familiarity with Greek philosophy.

The second form of dialectics, which is the one that comes closest to the German naturalists, is classical German philosophy, from Kant to Hegel. Here a start has already been made in that it has again become fashionable to return to Kant, even apart from the neo-Kantianism mentioned above. Since the discovery that Kant was the author of two brilliant hypotheses, without which theoretical natural science today simply cannot make progress — the theory, formerly credited to Laplace, of the origin of the solar system and the theory of the retardation of the earth's rotation by the tides — Kant is again held in honour among natural scientists, as he deserves to be. But to study dialectics in the works of Kant would be a uselessly laborious and little-remunerative task, as there is now available, in *Hegel's* works, a comprehensive compendium of dialectics, developed though it be from an utterly erroneous point of departure.

After, on the one hand, the reaction against "philosophy of nature" had run its course and had degenerated into mere abuse — a reaction that was largely justified by this erroneous point of departure and the helpless degeneration of Berlin Hegelianism; and after, on the other hand, natural science had been so conspicuously left in the lurch by current eclectic metaphysics in regard to its theoretical requirements, it will perhaps be possible to pronounce once more the name of Hegel in the presence of natural scientists without provoking that St. Vitus's dance which Herr Dühring so entertainingly performs.

First of all it must be established that here it is not at all a question of defending Hegel's point of departure: that spirit, mind, the idea, is primary and that the real world is only a copy of the idea. Already Feuerbach abandoned that. We all agree that in every field of science, in natural as in historical science, one must proceed from the given *facts,* in natural science therefore from the various material forms and the various forms of motion of matter; that therefore in theoretical natural science too the inter-connections are not to be built into the facts but to be discovered in them, and when discovered to be verified as far as possible by experiment.

Just as little can it be a question of maintaining the dogmatic content of the Hegelian system as it was preached by the Berlin Hegelians of the older and younger line. Hence, with the fall of the idealist point of departure, the system built upon it, in particular Hegelian philosophy of nature, also falls. It must however be recalled that the natural scientists' polemic against Hegel, in so far as they at all correctly understood him, was directed solely against these two points: viz., the idealist point of departure and the arbitrary, fact-defying construction of the system.

After allowance has been made for all this, there still remains Hegelian dialectics. It is the merit of Marx that, in contrast to the "peevish, arrogant, mediocre Epigonoi who now talk large in Germany", he was the first to have brought to the fore again the forgotten dialectical method, its connection with Hegelian dialectics and its distinction from the latter, and at the same time to have applied this method in *Capital* to the facts of an empirical science, political economy. And he did it so successfully that even in Germany the newer economic school rises above the vulgar free-trade system only by copying from Marx (often enough incorrectly), on pretence of criticising him.

In Hegel's dialectics there prevails the same inversion of all real inter-connection as in all other ramifications of his system. But, as Marx says: "The mystification which dialectics suffers in Hegel's hands by no means prevents him from being the first to present its general form of working in a comprehensive and conscious manner. With him it is standing on its head. It must be turned right side up again, if you would discover the rational kernel within the mystical shell."

In natural science itself, however, we often enough encounter theories in which the real relation is stood on its head, the reflection is taken for the original form, and which consequently need to be turned right side up again. Such theories quite often dominate for a considerable time. When for almost two centuries heat was considered a special mysterious substance instead of a form of motion of ordinary matter, that was precisely such a case and the mechanical theory of heat carried out the inverting. Nevertheless physics dominated by the caloric theory discovered a series of highly important laws of heat and cleared the way, particularly through Fourier and Sadi Carnot, for the correct conception, which now for its part had to put right side up the laws discovered by its predecessor, to translate them into its own language. [Carnot's function C literally inverted: 1/C =absolute temperature. Without this inversion nothing can be done with it.] Similarly, in chemistry the phlogistic theory first supplied the material, by a hundred years of experimental work, with the aid of which Lavoisier was able to discover in the oxygen obtained by Priestley the real antipode of the fantastic phlogiston and thus could throw overboard the entire phlogistic theory. But this did not in the least do away with the experimental results of phlogistics. On the contrary. They persisted, only their formulation was inverted, was translated from the phlogistic into the now valid chemical language and thus they retained their validity.

The relation of Hegelian dialectics to rational dialectics is the same as that of the caloric theory to the mechanical theory of heat and that of the phlogistic theory to the theory of Lavoisier.

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